

2. A process as in Claim 1 in which said occasional application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed.

3. A process as in Claim 1 wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

4. A process as in Claim 1 in which said occasional application of said electric potential is timed to occur at a frequency and for a period to maximize the quantity of hydrogen produced per the amount of electricity consumed and wherein a portion of said hydrogen is used by an energy conversion means to supply said electric potential.

5. A process as in Claim 1 in which said electric potential is applied across electrodes.

6. A process as in Claim 1 in which said electric potential is applied across multiple electrodes.

16. A process for producing hydrogen from anaerobically digested organic materials comprising the steps of:
placing said materials in a reaction zone; and applying an electric potential across said materials; thereby producing hydrogen and carbon dioxide whereby said electric potential is applied occasionally after periods without application of said electric potential whereby the amount of time required to reduce the amount of said organic materials is substantially reduced compared to the time required without application of said electric potential.

17. A process for conversion of biomass wastes into useful energy comprising the steps of: application of intermittent voltage for purposes selected from the group including depression of microorganismal activity that produces methane, enhancement of microorganismal

activity that produces hydrogen, and creation of an atmosphere within said biomass wastes that is maintained rich in hydrogen.

22. The process of claim 17 in which an inoculum means selected from the group including human sewage, medium from mature anaerobic digestion of organic materials within an occasionally applied voltage, and medium from anaerobic digestion that is conducted in the presence of increased concentrations of hydrogen wherein said inoculum is added to substantially organic materials selected from the group including manure, crop wastes, and garbage for purposes of increasing the efficiency of conversion of chemical potential energy in organic materials to hydrogen.

23. (New) A process for producing hydrogen from anaerobically digested organic materials comprising the steps of:

placing said materials in a reaction zone; and applying an electric potential across said materials; thereby producing hydrogen and carbon dioxide whereby said electric potential is applied occasionally after periods without application of said electric potential, separating said carbon dioxide and hydrogen.

24. (New) An energy conversion process comprised of the steps of anaerobically digesting organic materials to produce carbon dioxide and fuel selected from the group including hydrogen, methane, and mixtures of hydrogen and methane, and

separating said carbon dioxide from said fuel.

25. (New) The process of claim 17 in which said voltage is generated by a hydrogen fuel cell.